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ABSTRACT

Studies in psychology, language, and foreign language suggest that it is the qualitative nature of the task students perform while learning that is important, because of the creativity factor. Some explanations of creativity are concerned with hemisphericity of the brain. Another explanation is that creativity results from divergent rather than convergent thought processes. Classroom activities that encourage creative language use include those that allow students to feel comfortable expressing their ideas and using divergent answers, manipulating objects, acting out, and visualizing. It is these student-centered activities or creative classroom contexts, that provide meaningful language-processing experiences and improved learning. (MSE)

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Research in Creativity and Its Application in the Classroom

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What Is Creativity?

There is a consensus that "no fully matured, comprehensive theoretical statement has been developed which is directed specifically toward creativity."[1] Creativity has many definitions, however. Bloomberg, a well-known expert on creativity, states:

> The most impressive feature characterizing the area of creativity is its diversity. . . . In fact, controversy exists over the meaning of creativity. One observer judges the locus of creativity to be attributes within the person; another considers tangible products as the only viable means by which creative activity can be evaluated.[2]

Strasheim defines creativity as a response to a need: "Creativity is subjective, the end product of *one individual's* ambition and/or curiosity and *his* need to express that curiosity and/or ambition."[3] She distinguishes between creativity and innovation and says that the truly creative person is "one in a thousand—if not a million."[4] Birkmaier believes, however, that everyone possesses creative abilities to some degree. She includes "adventurous thinking or imaginativeness, an insatiable curiosity, getting away from the main track, being open to experience, permitting one thing to lead to another, discovering, innovating, and inventing"[5] as components of the creative process.

Mott presents another view of creativity as "magic in the mind,"[6] which she explains as "the broadest interpretation of creativity: the power

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to develop to the fullest all abilities, those that are known and those that are hidden; in other words, to be all that one can be."[7] Mott includes among creativity's components the ability to wonder, to be surprised and puzzled, to see what others have seen and to respond differently.

Hampden-Turner sees creativity this way:

> At the level of the creative mind the capacity to combine, recombine and reorganize received information and mental structures is explored, along with those syntheses which are more than the sum of their parts. The creative mind transcends mechanism.[8]

Guilford, who initiated the modern study of creativity with his well-known speech on the topic in 1950, developed the Structure-of-the-Intellect (SI) model in which 250 factors are identified, each representing a different mental process.[9] He believes that all of these factors may make a contribution to creativity at some time or place. Bloomberg states that "Guilford has contributed two important hypotheses concerning creativity: that (a) it is unrelated to intelligence and (b) it is a multidimensional variable."[10]

Why Are We Creative?

One explanation provided to account for creativity is hemisphericity of the brain, the theory that various abilities are located in one hemisphere of the brain or the other, and that each hemisphere has its own unique information-processing rules. The left brain is apparently characterized by verbal production, linear thinking, analytic thinking, rational thinking, time-orientation, and attention to details. The right brain is apparently characterized by visual-spatial ability, synthesis, parallel thinking, affective thinking, intuitive thinking, imagery, and attention to the whole.[11] Gowan, for example, believes that imagery in the right hemisphere produces creativity.[12] Nebes[13] recognizes the complementary nature of the skills of the left and right brains. Although the right brain deals with the visual-spatial and imagery aspects of language, and the left brain deals with the temporal and grammatical aspects of language, a helping relationship occurs between the halves of the brain.

Another explanation of the creative process is that creativity results

from divergent rather than convergent thought processes. If intelligence and creativity are widely used terms to describe the mind, convergent thinking and divergent thinking are terms often used to describe the cognitive processes. According to Guilford,[14] for example, the major component of creativity, though not the only one, is divergent production. Divergent production emphasizes the variety and quantity of information generated; it is often contrasted with convergent production that emphasizes a search for a single, previously determined answer. Divergent thinking is clearly different from intelligence as measured by IQ tests: IQ tests measure convergent processing, the ability to produce a single correct answer.

Numerous studies have been conducted to investigate brain functions in general, and cognitive processing in particular. The following section presents just a few of the studies related to creativity.

Research in Creativity

According to Bogen, numerous scholars have concluded that individuals "commonly employ two different *kinds of intelligence* or *modes of knowing* or (in a more modern vocabulary) two different *sets of information-processing rules*."[15] Bogen points out that classifying intelligence in two dichotomous categories has the important advantage of conforming to the physiology of the brain. Mental activity seems to occur in the right or left side based on the kinds of tasks that each side is able to perform. Haggard and Parkinson, [16] for example, found that a subject's identification of the content of a speech sample was processed by the left brain, but the perception of the emotional tone of the same speech was processed by the right brain. Bever and Chiarello[17] found that melodies are recognized by the left brain in most subjects but by the right brain in subjects with a moderate amount of musical training. Foss and Hakes conclude that "these and a number of other findings suggest that the nature of the hemispheric difference lies not in the stimuli the subjects are processing, but in the kind of processing they are performing."[18]

There is evidence that these different kinds of processing are a significant factor in learning. Craik and Lockhart,[19] for example, introduced the concept of levels of processing, which implies that the deeper the rehearsal during learning, the better and more durable the learning. Depth in their

experiments was defined by the degree of semantic involvement. During subsequent experiments by Craik and Tulving,[80] one group of subjects was asked to attend to the physical nature of words by noting whether or not they were capitalized (shallow processing). Another group attended to phonemic differences by judging whether or not words rhymed (intermediate processing). A third group processed words semantically by deciding whether the words fit into sentence blanks (deep processing). The results indicated that recall of words and semantic processing were positively related.

There are indications, however, that more than just semantic meaningfulness may be involved in the processing. In a study by Kolers,[81] subjects who read sentences upside down were able to recall more than those who read normal typography. Kolers suggests that students remember what is novel because it is analyzed more. In an effort to clarify "depth," Craik and Tulving performed a number of other experiments in which variables such as time, incidental versus instrumental conditions, laboratory versus classroom location, and motivation were manipulated. They conclude:

> It is abundantly clear that what determines the level of recall or recognition of a word event is not intention to learn, the amount of effort involved, the difficulty of the orienting task, the amount of time spent making judgments about the items, or even the amount of rehearsal the items receive (Craik and Watkins 1973), rather it is the qualitative nature of the task, the kind of operations carried out on the items that determines retention."

Perfetti agrees and states that "memory is a function of encoding context rather than task orientation."[83]

One type of context that has been investigated is that of subject-generated associations (mediators). Various studies suggest that mediators will enhance learning.[84] Bobrow and Bower[85] found when subjects were asked to make up their own mediators to help remember lists of paired associate words, learning was much better than when researchers gave them a sentence. In another study by McFarland, Frey and Rhodes,[86] subjects either judged if an experimenter-generated word fit a specific context or they generated their own word to fit the context. Subject-generated associations proved to be the most potent. Craik and Tulving suggest that "subjects remember not what was 'out there' but what they did during encoding."[87]

If Craik and Tulving are right about the nature of the encoding task, what students *do* during encoding is important. And if different kinds of cognitive tasks are performed by different parts of the brain, then it is appropriate to consider research that has investigated different kinds of learning tasks.

While distinctions between convergent and divergent thinking and between right and left brain processes refer to cognition in general, similar constructs may also be necessary for an understanding of the foreign language acquisition process. The next section looks at foreign language research related to creativity, and at foreign language research dealing with different kinds of learning tasks.

Foreign Language Research

In a study designed to find factors related to communicative competence, Bartz[28] found that two measures of fluency, two measures of flexibility, and six measures of originality significantly correlated with productive skills in communication in German. In other words, creativity factors and communicative factors were found to be related.

In a study by Giora,[29] activity in the right hemisphere of the brain was found to be related to speaking and very specifically to pronunciation ability. Krashen cites a study of adults in which it was found that "successful foreign-language students who were taught by an analytic, heavily deductive method of learning Spanish (explicit rules preceding practice) were predominantly [left-brain dominant], while a group of students who were successful at a more direct conversational, inductive approach did not have a preferred direction."[30]

Another report appears at first to be unrelated to creativity. To study the effects of a contextual visual on listening comprehension at two levels of proficiency, Mueller[31] gave one group of German students a visual before a listening passage; another group saw the visual after hearing the passage; and a third group only heard the listening passage. The beginning students who saw the visual before hearing the passage substantially increased their ability to recall what they had heard, and the students who saw the visual after the listening passage also recalled more. This effect was not evident, however, among more proficient students. As possible explanations of the results, Mueller suggests that the visual serves as an

advance organizer which heightens student interest. Mueller does not suggest hemisphericity as an explanation; nevertheless, since the visual would activate the information-processing specialties of the right brain, it appears that the task appealing to both hemispheres results in the greater recall of information. This is especially true for beginning language students who may still be limited by the grammatical aspects of the language and who may be unable otherwise to utilize right-brain capabilities.

In an experimental study[48] designed to investigate the role of creativity in learning foreign language vocabulary, two randomly selected groups of students were given tasks that required different types of cognitive processing in order to learn new vocabulary. One group was given vocabulary practice tasks requiring convergent processing, and the other group was given vocabulary practice tasks requiring divergent processing. The latter performed significantly better than the former on a recall measure.

Another finding in the same study seems to confirm part of Frymier's[49] theory. He suggests that students who are "low" in creative characteristics need materials that are "high" in such characteristics to learn best. In the aforementioned study of convergent and divergent processing, a group of low-intelligence students showed the greatest increase in learning by using the divergent tasks.

The studies in psychology, language, and foreign language cited above (and others) suggest that it is the qualitative nature of the task, what a student does while learning, that is important. Utilizing information-processing capabilities of both sides of the brain appears to be more effective: creativity, therefore, plays an important role in learning. The following section provides examples of the kinds of exercises and activities that, through creative cognitive processing, result in superior performance. Examples are from a food unit, but may be adapted to other vocabulary and grammar topics.

Creative Use of Language in the Classroom

Creativity is a multidimensional variable. One of its specific dimensions is semantic content: realistic content (expected information) versus imaginative content (novel information, the kind that leads to imagery, or that results in humor, surprise, or wonder).

Realistic: What color are the following foods?
Imaginative: What foods would you use to decorate a Christmas tree? to flavor your pens? as a hobby?

Another dimension is that of cognitive processing: convergent processing (seeking a single, predetermined correct answer) versus divergent processing (seeking multiple, open-ended answers):

Convergent: What common vegetable is orange?
Divergent: You are a famous chef. What are your favorite foods to serve?

If both dimensions (content and processing) are considered, the following combinations are possible.

Convergent Realistic (CR)	Divergent Realistic (DR)
Convergent Imaginative (CI)	Divergent Imaginative (DI)

The following examples compare how language is used in typical materials (CR and occasionally DR), and how it may be used in creative materials (CI and DI).

Set A: True/False

CR An apple is a fruit.
CI Banana soup is very popular.

Either/Or, Agree/Disagree

DR Tomato soup is better than vegetable soup.
DI Blue tomatoes have lots of vitamins.

Set B: Multiple Choice (One answer is correct.)

CR What food is a dessert?
a. onion b. cookies c. seafood
CI What would you feed a fantastic teacher?
a. apple b. spinach c. butter

Multiple Choice (Choices are provided, but none is "correct.")

DR Which food is a good dessert?
a. ice cream b. cookies c. cake

DI What would you feed to a hungry robot?
a. candy and cookies
b. ham and eggs
c. hamburger and fries

Set C Fill in the Blank/Completion

CR A ____ is a yellow fruit
CI The moon is made of green ____

Fill in (Multiple answers are possible.)

DR Juice can be made from ____
DI ____ is really good to eat before a test

Set D Matching

CR	A ____ is a vegetable	banana
	A ____ is a fruit	juice
	____ is a drink	ice cream
	____ is a dessert	pea
CI	An ____ a day keeps the doctor away	onion
	An ____ makes you cry	orange
	An ____ is named Humpty Dumpty	apple
	An ____ is a Florida favorite	egg

Sentence Builder

DR		chicken	for breakfast
		cereal	for lunch
	We eat	soup	for supper
		potatoes	for a snack
		cookies	
DI		carrots	on a desert island
		cheese	at midnight
	I want	shrimp	when I'm lonely
	to eat	apples	when it snows
		tomatoes	before English class

Set E: Question-Answer (There is a correct recognized answer.)

- CR What fruit is purple?
- CI According to Dr. Seuss, what foods are green?

Question-Answer (The answer is open-ended.)

- DR What are your favorite foods?
- DI If you were a famous biologist, what new foods would you develop?

Set F: Lists (There is a limited number of correct answers.)

- CR Make a list of vegetables.
- CI Make a list of things to put in sandwiches.

Lists (Possibilities are open-ended.)

- DR List the foods that you eat on vacation.
- DI List the foods that you would take on a five-year trip to Mars and back.

Set G: Classifying (Group the foods into categories.)

CR	Fruit, Vegetable, Meat	peas, pork
CI	Summer, Winter, Special Occasion	strawberries
DR	Delicious, Bland, Terrible	corn, steak
DI	Unusual, Useful, Attractive	grapes, ham
		tomatoes,
		chicken, etc.

Set H: Illustrations

- CR Illustrate dialogue lines.
- CI Make a food ad.
- DR Illustrate your favorite meal.
- DI Show unusual uses for food: a T-bone on a black eye, William Tell's apple, a car that's a lemon.

Creative Classroom Contexts for Use of Language

Jenkins explains quality of processing by using the term "contextualism." He makes the point that "what memory is depends on context."[36] The quality of an experience results from the "interaction of the experiences and the world, that is, the interaction of the organism and the physical relations that provide support for the experience."[37] Kolers believes that we remember remarkable amounts of detail regarding events

> We may remember not only what we read, but where on the page we read it, the color of the book's binding, whether it was in one language or another, and perhaps the weather at the time of reading and the lighting level of the room.[9]

Because everything that is out there may be noticed, analyzed, or utilized by the brain, the entire context is important in learning; thus, the physical classroom context in which the language is used is also very important. Students must have creative contexts in which to use language.

In a typical classroom context, cues such as those in the convergent and realistic examples above are given by the teacher to a whole class so that one student at a time may answer. Or they may be given to the students in writing to do for homework. Occasionally, there are personalized questions so that divergent realistic examples are possible: e.g., What do you like to eat for lunch?

Creative classroom activities are those that transcend mechanism. They allow students to use language meaningfully, have fun, express their feelings, ideas, and conclusions, or be interested in the feelings, ideas, and conclusions of others. They enhance student language practice and also encourage the use of various brain capabilities.

Even convergent realistic materials may be utilized more effectively in a creative setting. A number of games, for example, provide creative classroom contexts: bingo, concentration games, dice games, magazine scavenger hunts, twenty questions, charades, etc.[10]

Real use of language is divergent, however, so that students need situations for expressing their own ideas. There are numerous "partner practice" activities that provide such opportunities: (a) student partners may share a list of ideas and get each other's reactions;[11] (b) student partners may ask each other questions in a mini-interview and be responsible for reporting the answers, or (c) students may make up true-false statements, and present them orally to a partner, recording all responses.

Activities that involve real language as well as whole-brain processing are the "hands-on" activities. (The tactile sense is important to the right brain.)

1. People love to talk on the phone (especially teenagers). Use of full-sized toy telephones allows students to relax and talk more naturally.

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2. Even students that don't like skits usually don't mind doing a skit with a puppet, and student-prepared conversations improve substantially when the puppets are doing the talking.
3. Using realia from other countries and the teacher's slides allows students to visualize a more appropriate context for dialogues, for partner practices, and even for drill lines.
4. Simulations such as setting up a market provide a creative context in which to practice language.

Finally, activities that allow students to create products may also help them in language creativity:

1. Students may illustrate vocabulary words and phrases on flashcards, posters, on the board, or on transparencies.
2. Students may practice verb forms by drawing and illustrating time lines of their lives, a year in their lives, or a historical period of the target culture.
3. Students may draw appropriate pictures and label them or write about them. Monsters from outer space, for example, may be drawn and described in a vocabulary unit including parts of the body.
4. Students may make their own props. They may, for example, (a) paste pictures of food on paper plates for a restaurant simulation, an oral report to a partner, or to accompany a written description of the meal they've "prepared." (b) Students may make calendars including days of the week, months of the year, and labeled illustrations. They may personalize them even further by including birthdays, appointments, etc. (c) Students may prepare their own puppets.
5. Students may prepare items for graffiti boards on 5 x 8 index cards or 8½ x 11 colored paper. The topic may be vocabulary, examples of grammar such as illustrated sentences containing an irregular verb or verbs, or careers or culture. The teacher may then select the best student examples to display.
6. Students may draw, design, color, cut, and paste. Students may design stationery on which to write letters to students from another school. They may design creative photo albums for a unit on family and friends. They may prepare all kinds of greeting cards.

First-year students may "color-by-Spanish" if the colors are coded in the target language.

These are but a few of the numerous activities that encourage creative use of language in the classroom. Activities that allow students to feel comfortable expressing their ideas and use divergent answers are creative contexts. Activities that allow students to manipulate objects, to act out, and to visualize are creative contexts. It is these student-centered activities (creative classroom contexts) that provide meaningful language-processing experiences and improved learning for students. How fortunate it is that what provides better learning is also interesting and exciting.

Notes

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22 Craik and Tulving, p 290

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24 Editor's note see the article by Martha Nyikos in this volume

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37 See, for example the "Idea Exchange" sections of the *Ohio Modern Language Teachers Association Journal*, Barbara Snyder, ed , (1982) ERIC ED 216 534, (1983) ERIC ED 230 050 Also see *Loteria*, *Loterie*, and *Lotto* games available from National Textbook Company and *Veinte Preguntas* from J Weston Walch

38 See *Foreign Language News Notes*, Fall 1984, Glenview, IL Scott, Foresman and Company, p 4

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